

QIBA CT Small Lung Nodule (SLN) Biomarker Ctte (BC) Call

20 June 2019 at 11 AM CT

Call Summary

In attendance:

Samuel G. Armato III, PhD (Chair)

David Gierada, MD (Chair)

James Mulshine, MD (Chair)

Rick Avila, MS

RSNA:

Joe Koudelik

Julie Lisiecki

Moderator: Dr. Mulshine

Educational Conformance Video Proposed:

- Dr. Mulshine has been advocating for creating a [JoVE](#) publication/video on the QIBA SLN Profile Conformance process
 - A 10-15-minute educational video and accompanying manuscript would help phantom users better understand how the process works
- This video would demonstrate how to perform the phantom scan and use the analysis software
- Such an educational/marketing piece may be helpful as many sites do not appreciate the need for quantitation
- There is a significant difference between “passing well,” “passing,” or “barely passing” a conformance test
 - An overview of signal processing basics may also be needed
 - It is important to make sure that Profile claims address major clinical needs and problems
- More far-reaching technical marketing may improve usage of the QIBA Conformance Process
 - Mr. Avila is developing information for the Conformance website
- This video will be collaborative effort of the Small Lung Nodule BC leadership and will include the following:
 - Part I: Conformance Process, “How-to” for new sites to understand
 - Part II: Additional topics, such as possible sources of measurement error and mitigation strategies
- This project will take several months to prepare, as it will take time to produce the various visualizations
 - It will also be important to make sure that all targets are well-represented

Other topics requiring further discussion:

- Misclassifications of nodules within images can lead to misdiagnosis in clinical decisions; the imaging community may not be aware of the need for quantitation and may not realize how inaccurate their current imaging is
- The added value of quantitation and connection to artificial intelligence (AI) and deep learning must be emphasized, along with similar issues related to software
 - AI and deep learning provide algorithm decision support
- Sources of noise and variability must be addressed, such as image acquisition, scanner performance, reconstruction kernels, and analysis software
- Without quality images, it is very difficult to identify fine clinical details, like vessels, boundaries, etc., thereby making it difficult to make the correct diagnosis
- All of these issues are important to the evolution of quality quantitative imaging
- Guidelines will need to be general enough to apply to multiple areas but should solidify practical application

CTLX2 Phantom Development:

- The CTLX2 water-jacket phantom is progressing
- Mr. Avila is working on generation of MTF curves according to AAPM guidelines

- The CTLX2 phantom will address the shape of the body more closely to actual human measurements, to better address a concern from MITA regarding why calculations are different from the industry standard
- The CTLX2 phantom will solve specific problems that have not been addressed previously, like slice thickness, for example
- Mr. Avila is gathering more data for AAPM to review, demonstrating how the CTLX2 phantom will address a global need, particularly in relation to lung cancer screening, as screening often occurs in settings without proper physics support
- Increasing image quality will be beneficial across the spectrum of care

Working Toward Technical Conformance for the Profile:

- Dr. Gierada's colleague at Wash U has completed testing but still needs to complete the feedback form
- Two additional sites are needed to complete feasibility testing in order to generate a Checklist for the Profile
- Once this feasibility testing is complete, the Profile can move to the next stage of Technically Confirmed
- Until the data from Dr. Yankelevitz can be reviewed, it will not be known how consistent the scan technique is and whether it conforms to the Profile specifications

Action items:

- Dr. Mulshine to call [JoVE](#) regarding the video and manuscript deadline to see if an extension is possible
- Dr. Mulshine to follow up with Dr. Yankelevitz regarding the images for software conformance function
- Dr. Mulshine / Mr. Avila to touch base with Dr. Jackson regarding AAPM next steps
- Mr. Avila to draft an outline for the video and manuscript, addressing an outline of essential process steps and what issues should be highlighted

Next calls and deadlines:

- CT Small Lung Nodule BC: *tentatively scheduled* for July 18th at 1 pm CT
- Also – for CT Coordinating Committee members, the next call is Monday, August 19th at 11 am CT